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SHORT COMMUNICATION

ANTHRAQUINONES IN *MORINDA UMBELLATA* L.

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Plant. Morinda umbellata L.* (Rubiaceae).

Uses. Formerly as dyestuff.

Previous work. Root bark,[1] stems.[2] On sister species.[3–6]

Roots.† Light petroleum extract was separated into (*a*) sodium carbonate-soluble, (*b*) sodium hydroxide-soluble, and (*c*) neutral fractions. Extensive chromatography[7] gave, from (*a*), 2-*hydroxyanthraquinone*, *alizarin*, *alizarin* 1-*methyl ether*, *rubiadin*, *rubiadin* 1-*methyl ether*, and *xanthopurpurin;* from (*b*), *alizarin* 2-*methyl ether* and 1-*hydroxy*-2-*methylanthra-quinone;* from (*c*), 2-*methylanthraquinone*, 2-*methoxyanthraquinone*, and 1-*methoxy*-2-*methylanthraquinone*. Acetone extraction gave, in addition, *munjistin* and *lucidin*, and glycosides of rubiadin and rubiadin 1-methyl ether.

Stems. The same procedure yielded 2-*methylanthraquinone*,[2] 2-*hydroxyanthraquinone*, 2-*methoxyanthraquinone*, 1-*hydroxy*-2-*methylanthraquinone*, 1-*methoxy*-2-*methylanthraquinone*, *alizarin*, *alizarin* 1-*methyl ether*, *alizarin* 2-*methyl ether*, 1-*hydroxy*-2-*methylanthraquinone*, *xanthopurpurin*, *rubiadin*, and *rubiadin* 1-*methyl ether*.

In the original investigation[1] of *Morinda umbellata* several pigments were isolated but of these only morindone has been definitely identified.[8] It has been suggested[9] that one of Perkin's compounds was damnacanthal and that another might have been soranjidiol, 1,6-dihydroxy-2-methylanthraquinone,[10] both of which are now known to occur in other

* From Hong Kong, recently examined by Hui and Yee.[2]

† All compounds were identified (u.v., i.r., R_f, mixed m.p.) by direct comparison with authentic specimens.

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[8] J. L. SIMONSEN, *J. Chem. Soc.* **113**, 766 (1918); **125**, 721 (1924); R. BHATTACHARYA and J. L. SIMONSEN, *J. Indian Inst. Sci.* **10A**, 6 (1927).

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Morinda spp. A third compound was regarded by Perkin and Hummel[1] as 1,3-dihydroxy-6-methylanthraquinone. None of these was found in the *M. umbellata* we examined and none of the other pigments of Perkin and Hummel obviously corresponds with any of those described above.

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